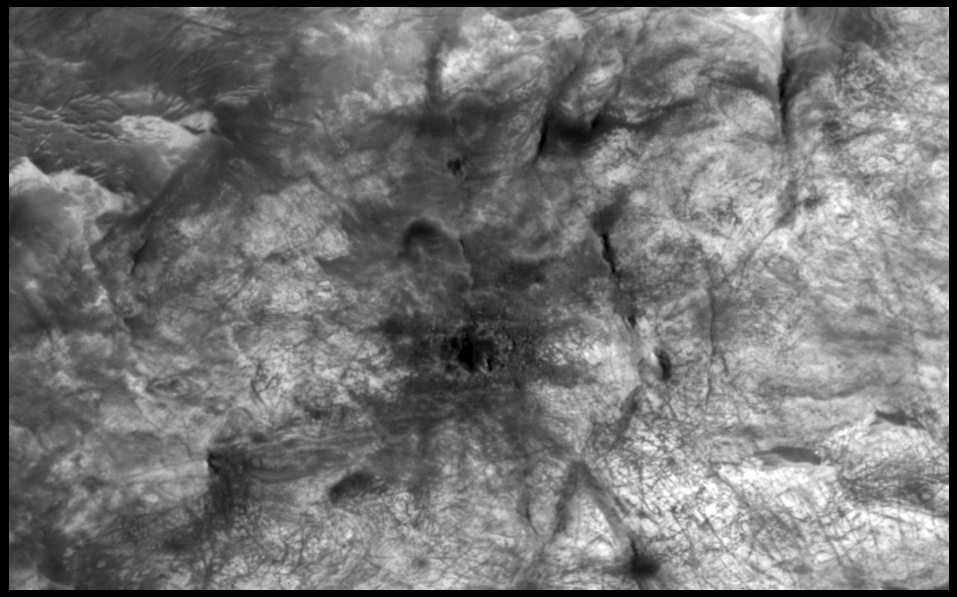
Small rayed craters in or near the MSL landing ellipses: insights into the recent erosional history and potential sampling locations at each site



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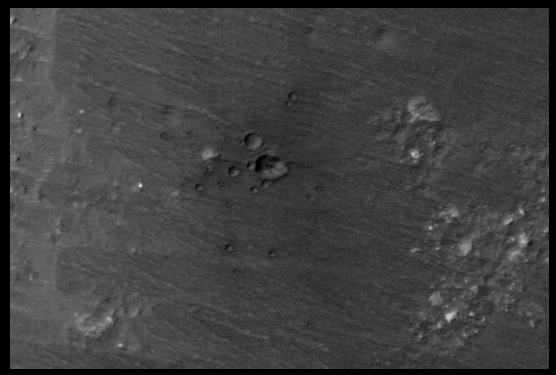
JPL/Caltech

JPL

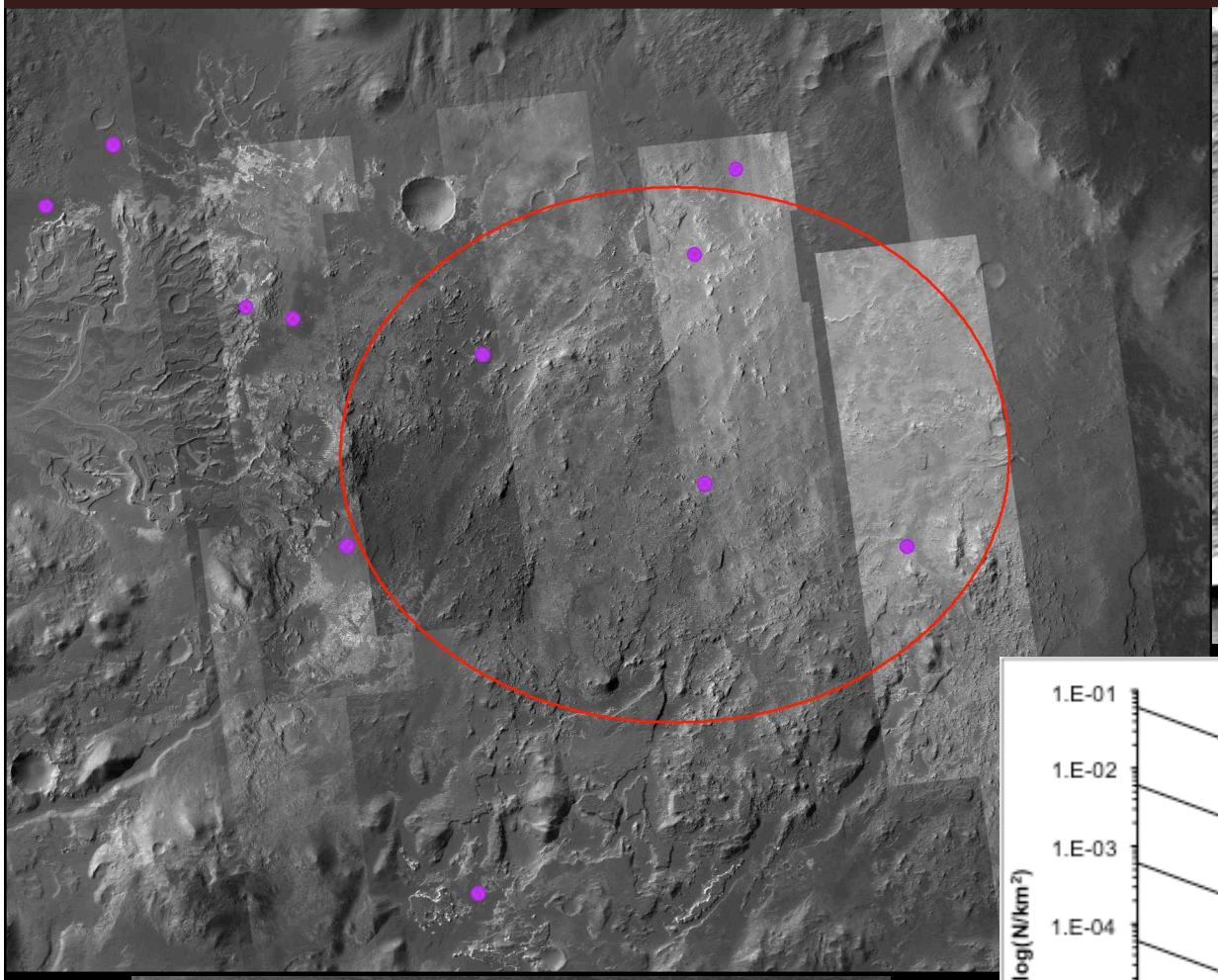
Caltech

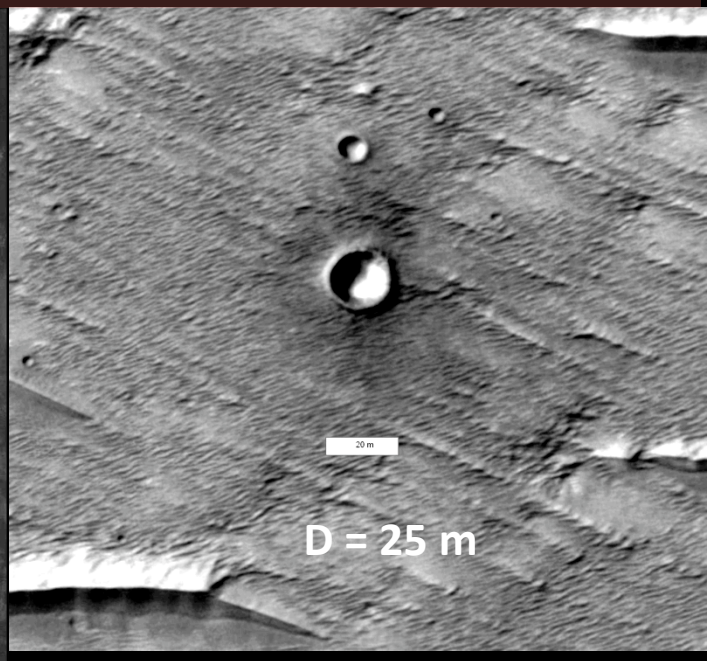
STUDY GOALS

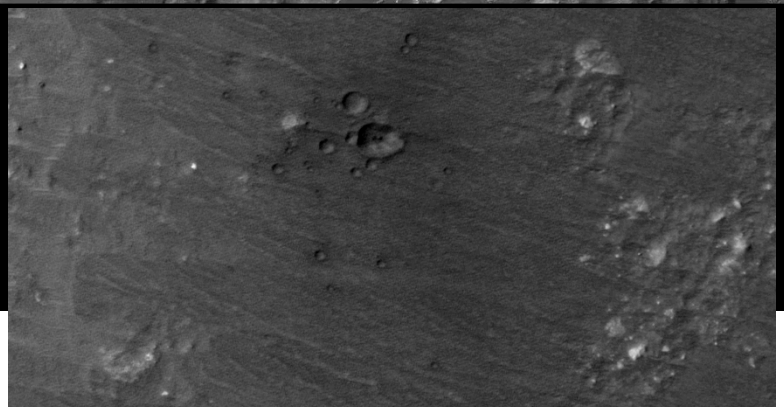
- Identify small rayed craters (D<1km) (SRC) to calculate *ejecta retention ages at each MSL site as a proxy for recent erosion. (the length of time ejecta remains around a crater rim)
- Determine “freshest” SRC in each landing ellipse.

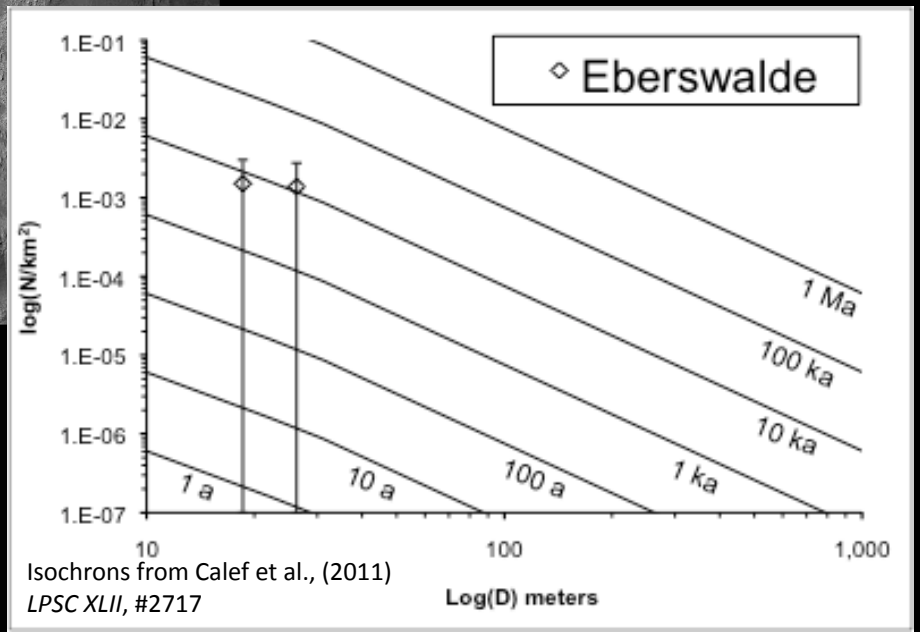


Eberswalde



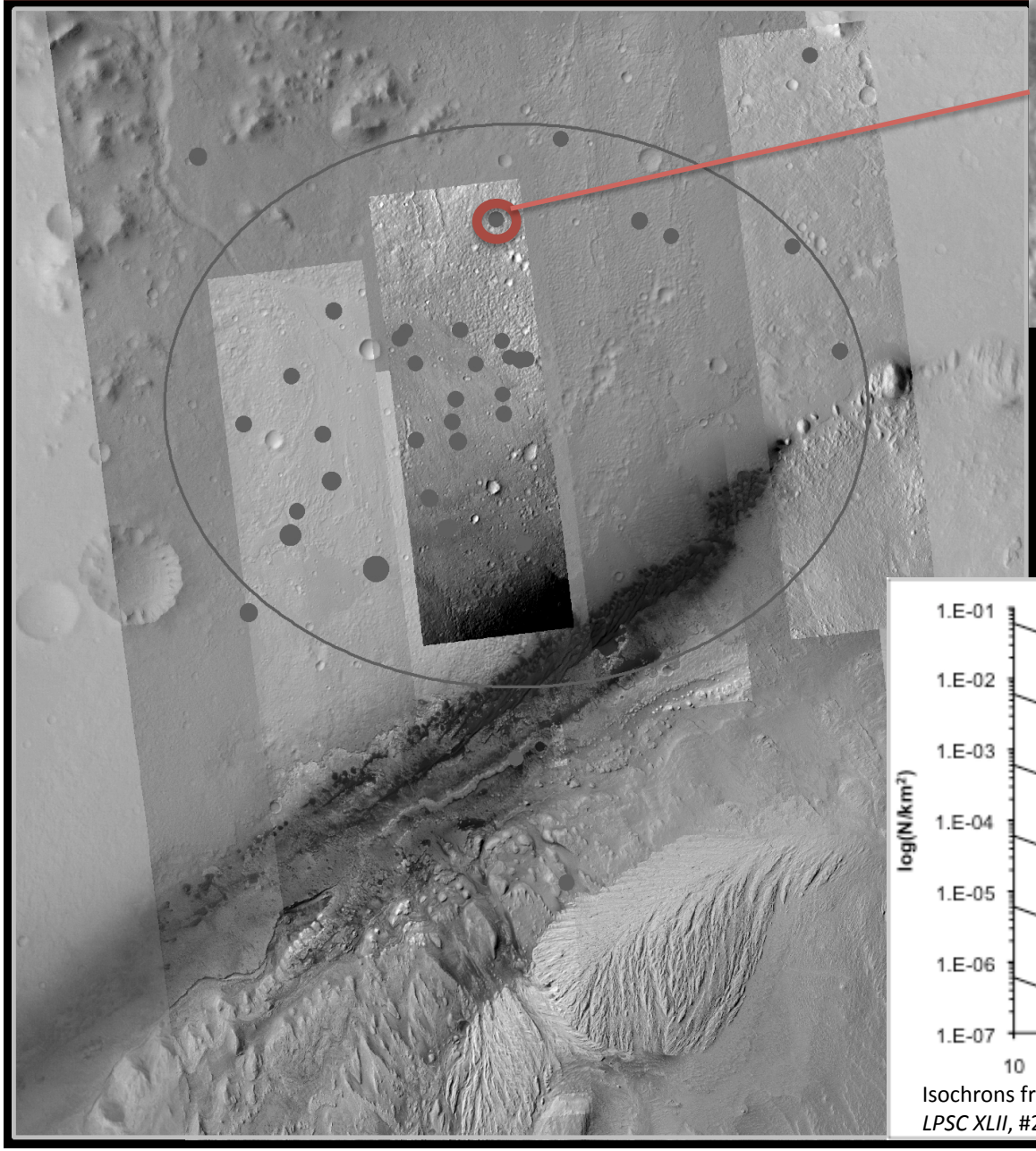


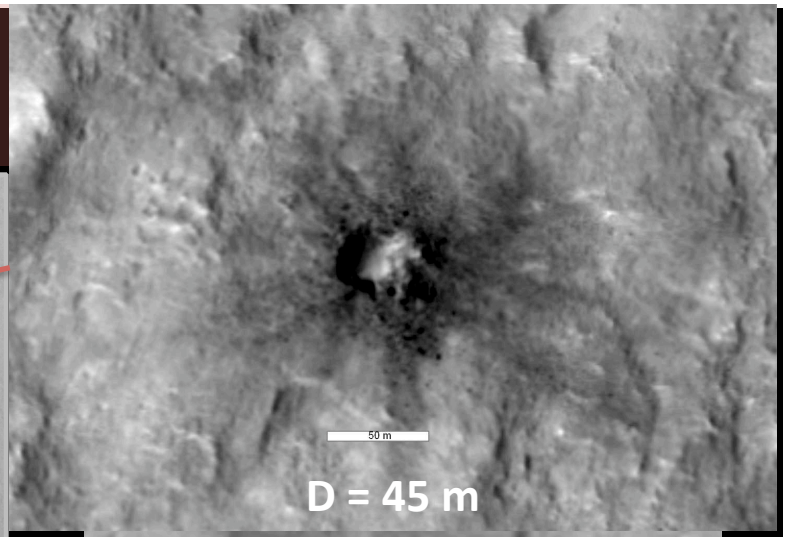


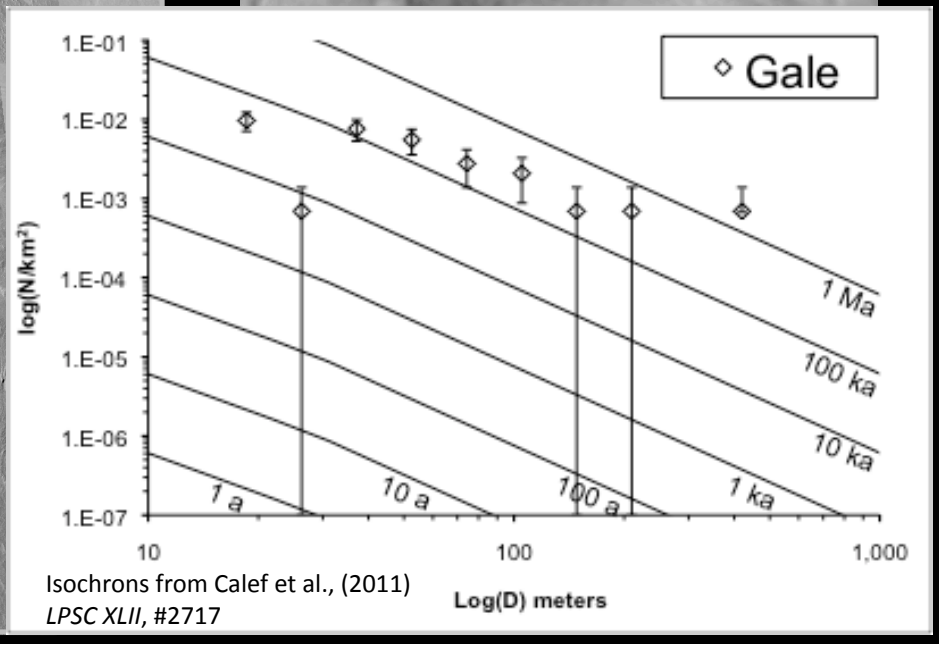


Isochrons from Calef et al., (2011)
LPSC XLII, #2717

Gale

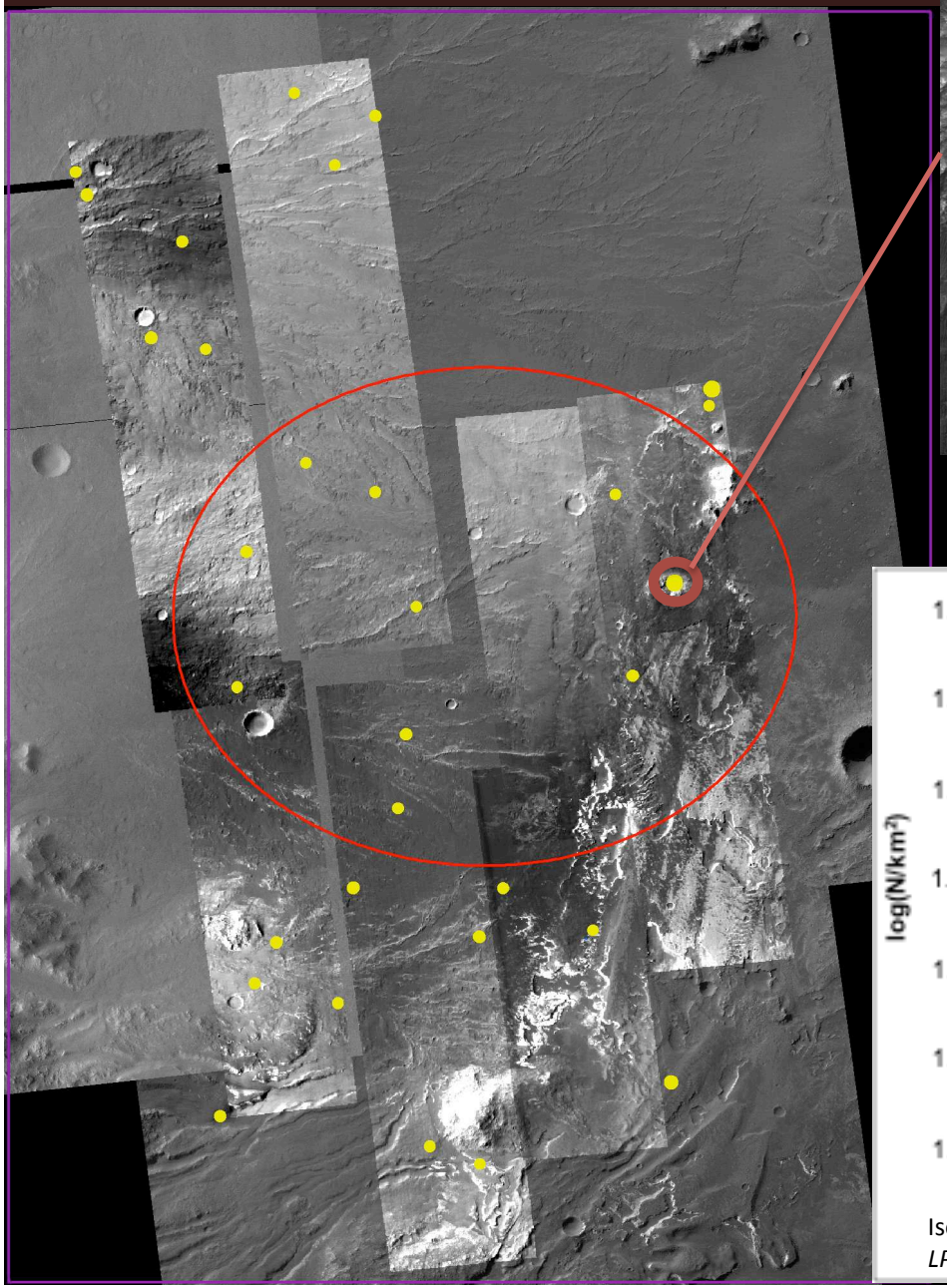


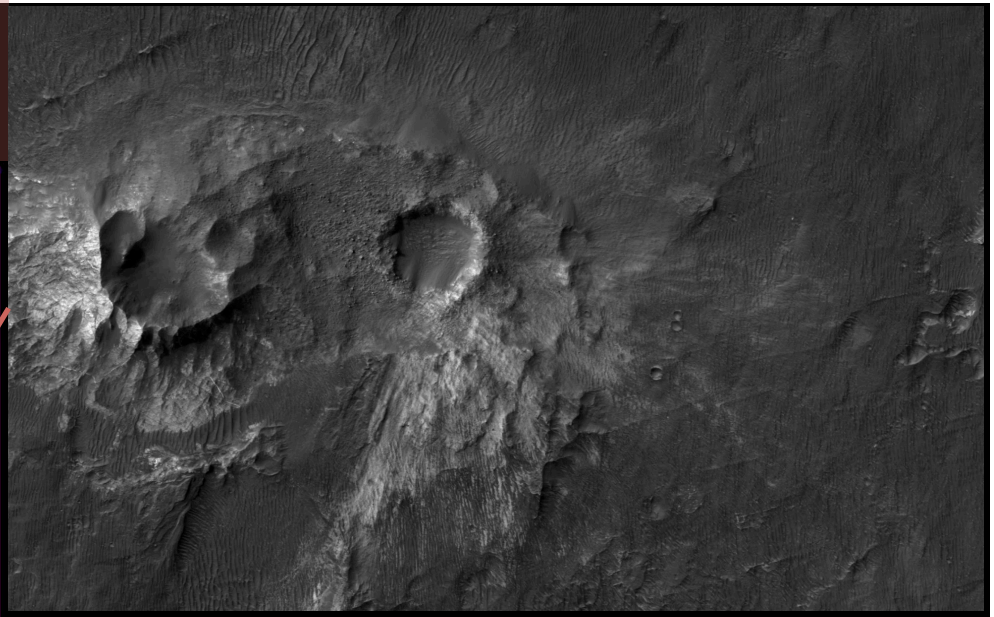




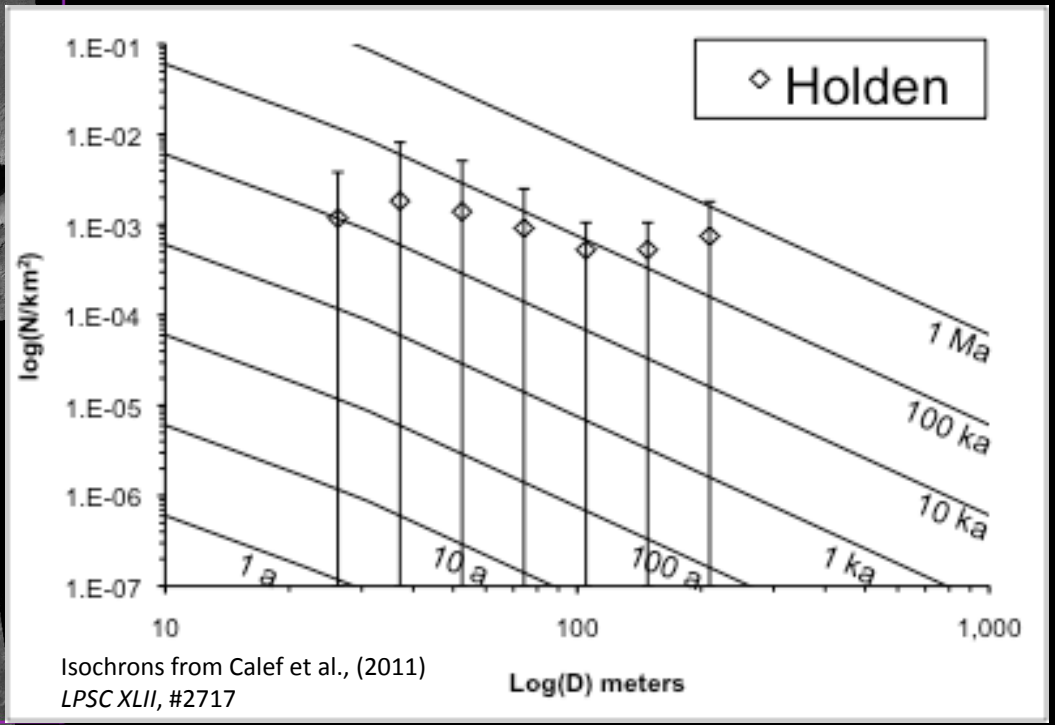
Isochrons from Calef et al., (2011)
LPSC XLII, #2717

Holden



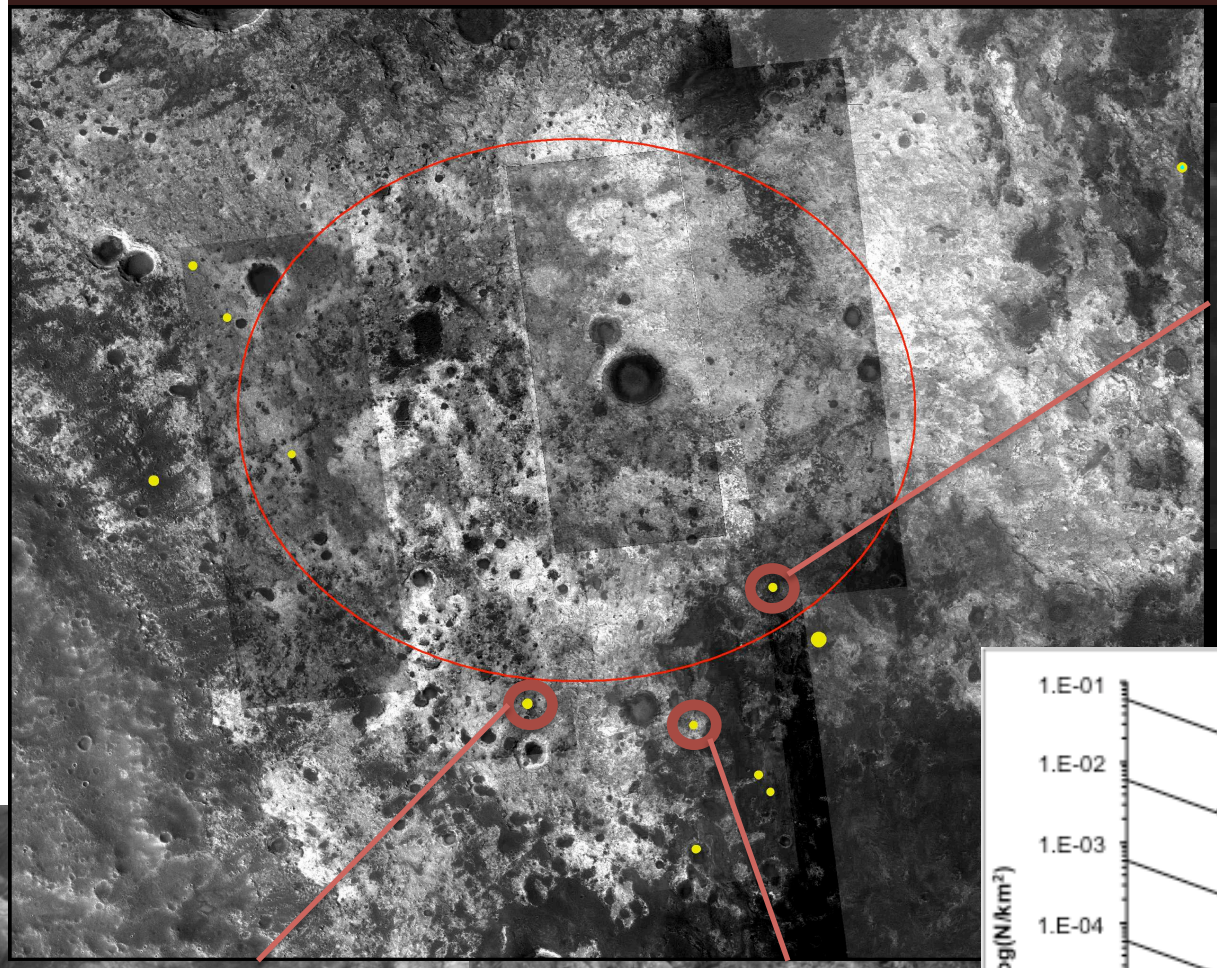


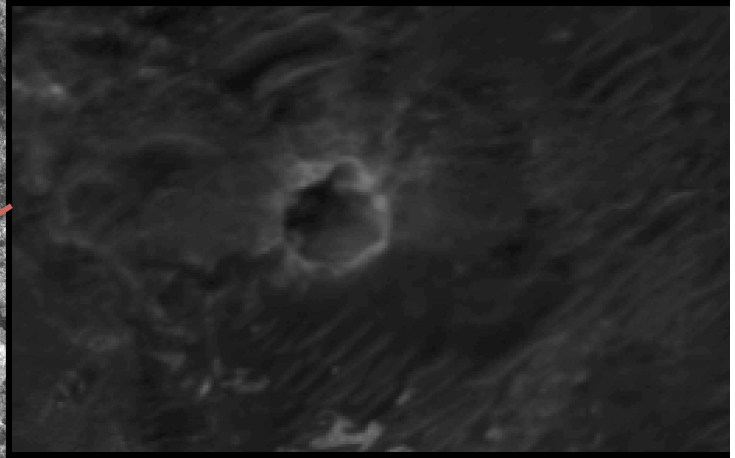
D = 235m



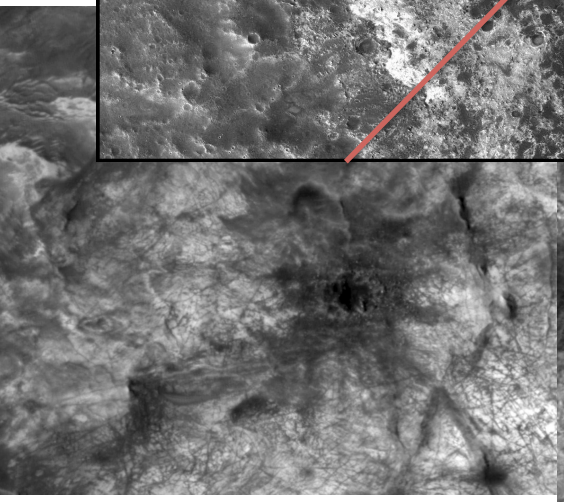
Isochrons from Calef et al., (2011)
LPSC XLII, #2717

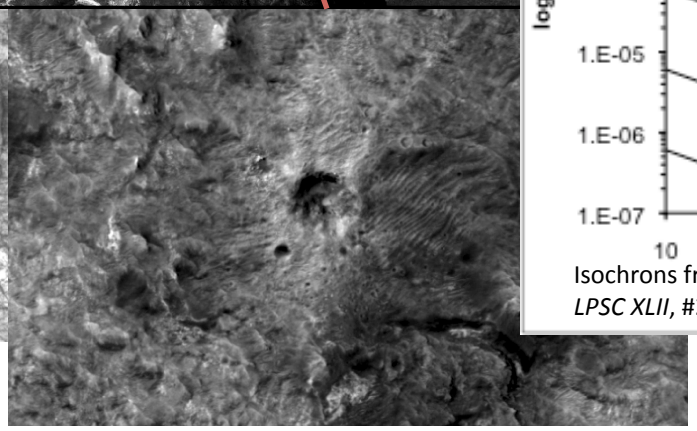
Mawrth

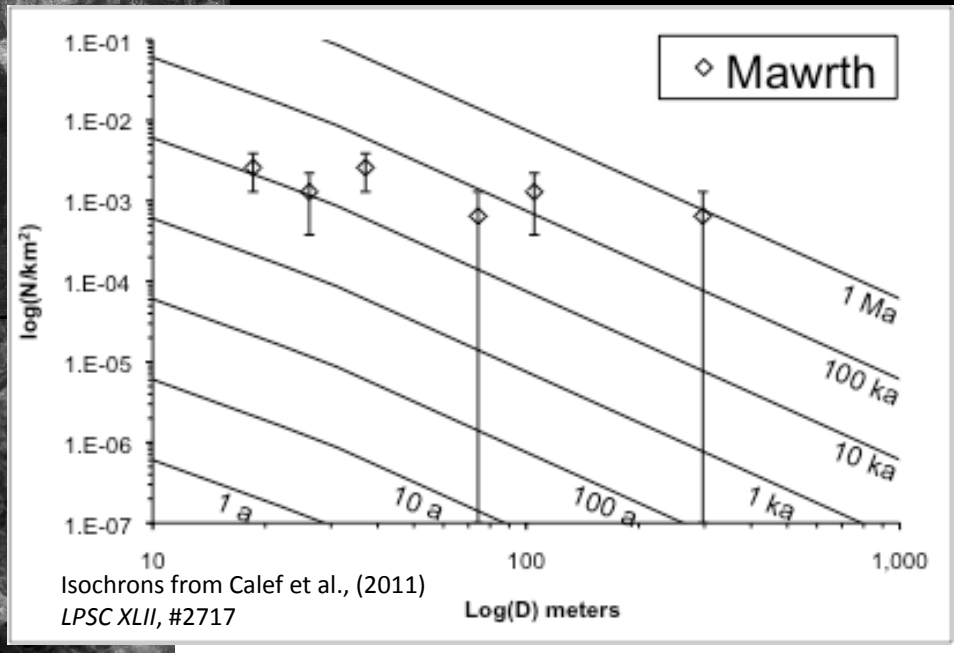




D = 38 m







Isochrons from Calef et al., (2011)
LPSC XLII, #2717

Conclusions

- Gale has "oldest" ejecta retention @ ~300 ka (i.e. eroded over longer timespan), followed by Holden @ ~80-120 ka.
- Mawrth has ages ranging from 10 ka – 1 Ma (eroding variably?)
- Eberswalde @ ~10 ka (few counts) has "youngest" retention (i.e. eroded over shorter timespans).
- Gale and Holden have several SRC that would make excellent "drive-by" sample targets.
- Eberswalde and Mawrth have few useful "fresh" craters in their ellipse.